OZONE DECOMPOSITION CATALYST

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Abstract of **JP6226095**

PURPOSE:To greatly improve activity as an ozone decomposition catalyst and the catalyst life enabling to sustain the high activity and to maintain the high ozone decomposition activity even under higher relative humidity condition, by using a heavy gamma-MnO2, produced by a chemical synthesis method, having a specific pore volume, a specific surface area and a specific volume.
CONSTITUTION:The ozone decomposition catalyst consists of the heavy gamma-MnO2 produced by a chemical synthesis method which is 0.2-0.5cc/g pore volume, >=80m<2>/g specific surface area and 0.7-2.0cc/g specific volume. Thus, the activity as an ozone decomposition catalyst is excellent and is superior in the stability enabling to sustain the high activity for long hours, compared to the catalyst using gamma-MnO2 prepared by a conventional electrolysis method or a chemical synthesis method, and simultaneously sustain the excellent activity and stability, even under high humidity environment.

[Cited Reference 2]

(TRANSLATION)
Japanese Patent Office
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Japanese Laid - Open Patent Publication
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Inventors: Norio Inoue (phonetic) et al
Applicant: Nikki Universal K.K. (phonetic)
Title of Invention: An ozone - decomposing catalyst

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What Is Claimed:

[Claim 1] An ozone - decomposing catalyst characterized by comprising heavy type γ - MnO_2 according to a chemical synthesizing method in which the porous volume is in the range of 0.2 to 0.5 cc / g, the comparative surface area is greater than 80 m^2 / g and the volume weight ratio is in the range of 0.7 to 2.0 cc / g.

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Partial English translations of pages 3 to 4:
[Example 1] 248 g of 95 % highly concentrated sulfuric acid was diluted with an ion exchange water thus to adjust 960 CC of the sulfuric acid solution of normality 5. The temperature of the thus obtained sulfuric acid solution was adjusted to be 70 ℃, and 229 g of Sofmax made by Chuo Denki Kogyo K.K. (containing 99.3 percent of Mn_3O_4) was added thereinto while stirring it well, and the resultant mixture was heat - treated for a period of one hour at a temperature of 70 ℃. After the heat treatment had been completed, the filtered precipitate was repeatedly washed with ion exchange water till the pH of the filtered solution became greater than 3.0. Thereafter the precipitate was taken out and it was dried at a temperature of 150 ℃ for a period of 10 hours thus to obtain 82 g of γ - MnO_2 having a volume weight ratio of 2.40 cc / g.

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Partial English translations of pages 4:
[0024] 50 g of the thus obtained dry γ - MnO_2 (with a volume of 100 cc) was put into a ball mill vessel (with an inner volume of 500 cc) and the ball mill treatment was carried out for ten hours for making it heavy thus to obtain heavy γ - MnO_2 having a volume weight ratio of 0.84 cc / g. A photo of the surface thereof taken by a scanning electronic microscope is shown in Figure 2. As it is clear from Figure 2, it is confirmed that the needle - like projections on the surface of heavy - treated γ - MnO_2 are missing. 500 g of the thus - prepared γ - MnO_2 and 150 g of Snowtex made by Nissan Kagaku Kogyo K.K. (containing 20 percent of colloidal silica) was well mixed with 780 g of ion exchange water thus to prepare

slurry. 600 cell / square inch of ceramic fiber honeycomb made by Nichias K.K. (with a trade name of "Honycle" having a width of 75 mm, a length of 75 mm and a height of 10 mm) was immersed in said slurry and thereafter it was taken out and the excessive slurry was blown away by blowing air against it and thereafter it was dried at a temperature of 150m ℃ for a period of 5 hours thus to prepare catalyst A in which the support amount of heavy γ- MnO_2 having a comparative area of 138m^2 / g is 161 g / l.

[Test Example 1] Such a kind of test gas which was so adjusted as to have an ozone concentration of 2 ppm, a relative humidity of 40 percent and a temperature of 20 ℃ was flowed at a space velocity of 180000 $^{h-1}$ to a reactor filled with a test catalyst (with a diameter of 22 mm and a depth of 10 mm) and the ozone concentrations at the inlet and the outlets of the reactor after elapses of 2 hours and 10 hours, and the ozone decomposition rate, that is, the percentage obtained by dividing the difference between the inlet concentration and the outlet concentration with the inlet concentration.

[0030] By the use of the catalyst A of the present invention prepared according to the above- mentioned Example 1 and catalyst X consisting of non - heavy γ- MnO_2, the ozone decomposition rate was obtained and the results thereof are shown in Table 1.

[0031]

[T a b l e 1]

Catalyst	Support Amount	Ozone Decomposition Rate (%)	
	(g / l)	2 hours later	10 hours later
Catalyst A	161	94	90
Catalyst X	59	89	71